

Aquatic Exercise Programming for People with Multiple Sclerosis

MATERIALS FOR AQUATIC EXERCISE INSTRUCTORS



Edited by Deborah P. Hertz, MPH, National Director, Medical programs Clinical Programs Department
National MS Society, New York, NY. 212-476-0468.

Contributors: Helen Tilden, RN, National MS Society, Georgia Chapter Clinical Advisory Committee and National MS Society, Special Project Consultant

Miranda Mirsec MA, CES, National MS Society Southern California Chapter Programs Manager,
Physical Health and Recreation

Brian Hutchinson, MS PT, President, Heuga Center and National MS Society Clinical Consultant

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- Email: MD_info@nmss.org, healthprof_info@nmss.org
- Professional website: nationalMSsociety.org/For-Professionals/Clinical-Care

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Front cover photo: Robert, diagnosed in 1990

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Aquatic Programming for People with MS

WHY WATER WORKS?!

Water is a very inviting exercise environment for many people with MS. Cool water temperatures—80-84 degrees Fahrenheit—helps to keep core body temperatures low, reducing the chances of overheating. As mentioned in **Intro to MS for Fitness and Wellness Professionals**, overheating can cause temporary worsening of MS symptoms.

The natural properties of water—including buoyancy or weightlessness combined with resistance—create an excellent environment for movement and exercise. Participants can learn to use the properties of water to best meet their specific exercise/fitness needs. Likewise exercise in a pool offers stability and support to practice functional activities such as ambulation. Water often provides support many people with MS need to stand and maintain balance for exercises that would otherwise be too difficult on land.

AQUATIC PROGRAMS FOR PEOPLE WITH MS

The purpose of an aquatic recreational program is socialization and exercise, and is intended to meet goals such as increased function and sense of well-being. The aquatic class is not intended to be a “hands on” treatment or therapy. A recreational program is designed to offer people with MS with varying levels of disability or activity limitations an opportunity to participate, including individuals who use assistive devices. The class is taught in shallow water in a group setting with an emphasis on fun and independence. Benefits will vary from individual to individual.

An aquatic program can include aerobic exercise, strengthening, balance training, and stretching in addition to a warm-up and cool-down. Recreation is diversion, rest, relaxation, entertainment, exercise, play and hopefully, enjoyable. The aquatic program for people

with MS provides an opportunity to maintain mobility, prevent secondary symptoms of MS, maintain or improve flexibility, maximize muscle strength, and maintain or increase endurance potential.

The recommended pool temperature for an aquatics program for people with MS is 80–84 degrees.

BENEFITS AND CONSIDERATIONS OF AN AQUATIC PROGRAM

From **Report of the Surgeon General**, United States Department of Health and Human Services, (1996), “People with disabilities are less likely to engage in regular moderate activity than people without disabilities, yet they have similar needs to promote their health and prevent unnecessary disease.” The report also recommends “community based programs to meet the needs of persons with disabilities.” A community based aquatic exercise program is an excellent way to add activity, strengthen the cardiovascular system, reduce body fat, and decrease stress.

Water offers benefits such as:

- Less energy expenditure required for movements
- Increased muscle strength due to use of water resistance
- Opportunity to practice balance and coordination (with more ease than on land)
- Relaxing effects of buoyancy on the skeletal structure and increased ease of walking in water due to buoyancy
- Protection from falls (“soft” landing)
- Opportunity to weight bear on the lower extremities
- Increased circulation
- A cool exercise environment which can increase endurance with activity

Possible considerations may include:

- Loss of balance due to upward thrust of buoyancy, use of foam equipment or deep water.
- Fatigue and muscle weakness if water temperature is too warm
- Effects of incontinence
- Skin breakdown
- Decreased opportunity for full weight bearing
- Fear of water

FOCUS ON FUNCTION

In general, most movement is beneficial for individuals living with MS. As you focus on developing programs for people with MS, consider movements that address functional activities.

Contributing factors include:

- Weakness
- Spasticity/Spasms
- Lack of coordination
- Balance difficulties
- Tremors
- Fatigue
- Pain

A focus on function in the pool means choosing exercises/activities with the goal of improving coordination, flexibility, balance, muscle strength, endurance, and possibly cardiovascular fitness. Exercises in these areas can improve functional mobility such as transfers, gait and stair climbing. Most importantly, the activities need to be engaging.

Strategies for Adapting Movement

Components of exercise design to be considered when developing a multiple sclerosis aquatic class include:

- Water properties
- Functional levels defined in the **Intro to MS for Fitness and Wellness Professionals**
- Body mechanics—minor and subtle changes to hand position, body alignment and body composition, alter movement intensity by maximizing or minimizing the effect of water properties
- Impact options—water is an excellent medium for exercise because of the reduced gravitational forces experienced by the body when partially submerged. This produces a lower impact alternative to land-based exercises
- Equipment

Remember that symptoms of MS are different for each individual and may change daily or weekly. Be sure to discuss potential adaptations of a movement with participants, and always remind them to consult with their physician if symptoms change.

USING THE PHYSICAL PROPERTIES OF WATER

Familiarity with the physical properties of water can help instructors create exercise sessions that are safe, challenging and interesting.

Laws and properties include:

- Buoyancy versus gravity
- Inertia
- Resistance
- Leverage
- Action and reaction
- Hydrostatic pressure
- Surface tension
- Drag
- Turbulent flow
- Speed, power and force
- Temperature

Here are examples of how to use water properties to maximize pool activities:

- Change the surface area and speed of movement
- Change the depth of water altering weight bearing properties
- Vary impact levels
- Enlarge a movement, using the property of buoyancy to support the lever
- Change the planes of movement
- Travel

CONSIDERING FUNCTIONAL LEVELS

When designing a session keep in mind the three levels of ability (defined in the **Intro to MS for Fitness and Wellness Professionals**) to better meet the needs of all your students/clients. Movements can be altered to match the abilities of individuals. For example individuals interested in improving sit to stand transfers may concentrate more on lower extremity strengthening and stretching exercises.

Remember, symptoms of MS are different for each individual and may change daily or weekly.

Be sure to discuss specific limitations with each student. In addition, involve participants when modifications of exercises are necessary so that they can adapt a movement to best meet their needs.

BODY MECHANICS

Body mechanics can be a useful strategy for adapting movement. Minor and subtle changes to hand positions, body alignment and length of body levers changes movement intensity by maximizing or minimizing the effect of water properties. Additionally, the impact body composition has on movement execution can assist instructors to make effective movement choices and adaptation.

HAND POSITIONS:

- **Fist**—hand(s) clenched to form a fist
- **Webbed**—fingers spread apart and extended
- **Clawed**—fingers flexed in claw fashion but not clenched as a fist
- **Sliced**—fingers together and moving hand in “chopping” movement

BODY ALIGNMENT

Neutral spine is keeping the vertebral spine in its natural alignment with normal curves in the cervical and lumbar areas. The importance of maintaining torso control and proper body alignment is noticeable with new participants who haven't made the adjustment from movement in a gravity-based environment to a buoyancy-based environment. Adjusting to a new center of gravity (from hip area to lung area) is sometimes difficult for new participants. Instructors can help participants by encouraging them to maintain a neutral spine. As participants become more skilled, changing planes can challenge torso control.

Posture is more difficult in water if the depth is above the navel toward the mid-chest area.

The upward thrust of buoyancy creates an instability and improper foot placement. Bring the class to a more shallow area of the pool to permit control, alignment, and foot strike. The shallow water affords cooling, protection from falls, and body awareness.

Proper standing alignment:

- Feet parallel, slightly apart with weight evenly distributed on the heels, outside borders, and balls of the feet
- Knees soft and relaxed
- Hips are tucked, slight posterior pelvic tilt
- The abdomen is flat
- Chest is high with rib cage lifted
- Shoulders are level, with shoulder blades flat
- Head is centered over trunk with chin slightly retracted and ears over shoulder
- Arms are relaxed with palms facing the sides of the body
- Spine is in neutral position, meaning when viewed from the side there is an anterior cervical curve or lordosis, followed by a posterior thoracic curve or kyphosis and a lumbar lordosis

LEVERS

Our body consists of levers. Bones act as lever arms and joints function as fulcrums of these levers. An extended arm can be used in water exercise to increase resistance--the longer the lever the greater the surface area. The opposite is true if the desire is to decrease resistance, a shortened lever or flexed elbow joint created less demand on the shoulder than an extended elbow joint. It is understandable why taller people, with longer limbs, find it more difficult to move through water than someone with shorter limbs. Keep in mind that longer lever movements integrated into a class format require more time to execute.

BODY COMPOSITION

The ratio of lean body mass to fat body mass affects buoyancy and therefore can affect the intensity of executing a movement. Someone with a high percentage of body fat easily floats while a more muscular individual would sink. A person with limited strength and/or who is less lean may have more difficulty controlling buoyancy and buoyancy equipment. Teaching body mechanics as a means of movement adaptation enables participants to increase or decrease movement intensity. Here are some examples:

- “Place hands in a webbed position to increase surface area, which increases movement resistance.”
- “Keep knees extended while walking to increase resistance.”
- Offer support/buoyancy equipment to assist individuals experiencing difficulty because of low body fat composition.

IMPACT OPTIONS FOR AQUATIC EXERCISE

Water is an excellent medium for exercise because of the reduced gravitational forces experienced when partially submerged. This provides a lower impact alternative to land-based activities. Impact forces can be modified even further in water. Keep in mind that some individuals will adapt to increasing the intensity of water exercises but may not physically be able to increase the impact.

REBOUND

Rebounding is standing in an upright position and pushing off from the pool bottom. It is a common movement used in aquatic programs because it is most similar to land-based activities.

GROUNDED/NEUTRAL

The grounded or neutral position involves flexing at the hips and knees to lower the body to a position where the shoulders are a few inches above the water's surface. This level

of impact is also seen with standing upright activities without the bounce/rebound in the movement. The feet will still contact the pool bottom but without the jumping force. This allows the reduced impact benefit of exercising at chest depth without compromising control of movement.

SUSPENDED

The suspended position involves flexing at the hips and knees to lower the body to a position where the shoulders are at the water's surface while keeping the feet elevated from the pool bottom for several counts. This simulates deep-water exercise in the shallow area of the pool. Suspended position requires increased involvement of the upper body musculature to maintain the suspended position, and may not be comfortable for non-swimmers. To take advantage of this level, without the upper body strength requirements, buoyancy equipment can be used.

Impact Option Positions

- **Rebound position:** places the most impact on the body.
- **Grounded/ neutral position:** places some impact on the body.
- **Suspended position:** does not place any impact on the body.

USE OF EQUIPMENT

Equipment is not needed to conduct an effective program. However, floatation devices such as noodles, bar bells or kickboards will assist with balance when walking and will add interest and variety to the class. Safety of participants is, of course, the most important consideration.

An important first step in selecting the appropriate aquatic exercise equipment is to determine the needs of the participants. Next, determine which type of equipment will best meet these needs. Once you have made an equipment selection, knowing how to use it

correctly is essential. Improper use can decrease effectiveness and possibly cause injury.

The types of equipment that may be useful in your classes are:

- Buoyant/floatation equipment
- Gravity (weighted) equipment
- Drag equipment
- Rubberized equipment

Considerations:

- Home-made or make-shift devices such as milk jugs are inappropriate and unsafe. Be sure to use equipment that is designed for pool use and inspect each piece before every class to ensure there are no missing or broken parts.
- Extra buoyancy and resistance of some equipment has the risk of increasing fatigue and loss of balance.
- Recognize muscle weakness and the deconditioned state of participants. Weak muscles tire quickly and are inefficient. Therefore, do not use equipment until a participant is familiar with his/her personal level of fatigability and balance in the pool. It may take several classes to acclimate to the upward thrust of buoyancy, the extra buoyancy of foam equipment, and the intensity that equipment adds to the program. Ask participants to practice movements without equipment until they understand how it should "feel", then add equipment.
- Devices used to assist buoyancy, resistance, or floatation are not intended as life saving devices.
- Lifts, steps, or chairs for pool entry are available through major pool suppliers. Assistive devices such as shower chairs or reaching sticks for the locker room are available locally in many areas (check the yellow pages under medical equipment or durable medical equipment.)

- Equipment made from latex material should be carefully considered due to potential problems with latex allergies/sensitivity

Prior to using any equipment, it is important to evaluate the following, to determine appropriateness:

- Establish intended use/application
- Rate effectiveness
- Assess for correct body mechanics with and without use of equipment
- Identify contraindications/risks (musculoskeletal injury)
- Determine benefits
- Identify limitations (cost, availability, ability level)

BUOYANT/FLOTATION EQUIPMENT

Buoyancy works in the opposite direction of gravity. Buoyancy/flotation equipment reduces the effects of gravity on the body and assists with floatation. The tendency of this equipment is to rise to the surface of the water, therefore any movement toward the surface of the water is “assisted” and any movement toward the bottom is “resisted”.

Types of buoyancy/flotation equipment:

- Floatation belts/ankle floats
- Noodles, rods
- Foam dumbbells
- Balls
- Kickboards

Advantages:

1. Adaptable to most fitness levels
2. Lightweight
3. Relatively low expense

Disadvantages:

1. Tend to be bulky
2. Difficult to store
3. Can cause overload injuries on joints and muscles

GRAVITY (WEIGHTED) EQUIPMENT

Weights use different muscle groups than those worked with buoyancy equipment. With weighted equipment, all movements toward the bottom of the pool are “assisted” and all movements toward the pool’s surface are “resisted”.

Types of weighted equipment

- Ankle weights
- Medicine balls

Advantages:

1. Offers an opportunity to work on weight bearing
2. Can add variety to program
3. Reasonably inexpensive and easy to store

Disadvantages:

1. Difficult to transport
2. Difficult to recover when dropped in pool

Recommendations:

- Make sure the weighted equipment will hold up well in water
- Use of ankle weights during aerobic exercise is not recommended due to the increase of potential injury to muscles and joints

DRAG EQUIPMENT

Drag equipment can be very useful in a water environment. The shape of equipment, velocity or speed of movement, turbulence and water depth affect the amount of resistance that can be achieved during water exercise.

Types of drag equipment:

- Webbed gloves
- Drag parachutes
- Hand held paddles, bells, and boards
- Water boots
- Shoes

Advantages:

1. Can be used in nearly all directions
2. Adaptable to most fitness levels
3. Lightweight and easy to transport

Disadvantages:

1. Requires more knowledge of water skills by the instructor
2. Can place adverse stress on joints and muscles if inappropriately used

RUBBERIZED EQUIPMENT

Rubberized equipment is designed as circular bands or tubing cut to a desired length. Different tensions are available, varied by width or thickness of the band or tube. This equipment can be beneficial for strength building or out of the water.

Types of rubberized equipment:

- Bands
- Tubing
- Balls

Advantages:

1. Inexpensive
2. Easy to transport and use
3. Adds variety to exercise program

Disadvantages:

1. Short life span of equipment
2. May adversely affect proper body mechanics
3. Potential allergies to latex materials—explore latex substitutes

GENERAL EXERCISE PRINCIPLES

It is important to keep general exercise principles in mind when recommending aquatic exercises for people with multiple sclerosis as it is common to see diverse ability levels among people with MS. Likewise, ability levels may change from session to session depending upon a number of factors. However, there are some general principles to keep in mind:

- **Breathing**—Encourage normal breathing during exercises. Holding one's breath should be discouraged.
- **Posture**—It is important to encourage proper postural alignment during activities to avoid undue musculoskeletal stress.
- **Positioning**—Have participants use their stronger side for support – a pool wall is fine when initially learning the exercise.
- **Listen to what the body is saying**—It is important to listen to the signals the body is sending to avoid fatigue. Exercising to the point of fatigue is NOT recommended. Stop before becoming tired and progress slowly.

Exercises for People with MS

The following exercises are examples of many activities that can be beneficial to people living with MS. By combining exercises and integrating movement strategies (e.g., changes in movement direction and speed, body positioning and use of equipment) an instructor can develop an effective, challenging and motivational format for the class.

The exercises noted address flexibility, strength, endurance, balance, coordination and overall functional mobility. People with MS may require additional attention in one area based on their condition. However, a well rounded program will include a variety of categories of exercise.

NOTE: Fatigue, weakness or other symptoms may increase with over activity or heat and may change daily, weekly, or suddenly (during class) with no apparent cause. Be prepared to make changes in the midst of class to address the situation of the day. Participants should leave the class feeling refreshed, with a sense of well-being and accomplishment. Do not work them to exhaustion. People need to be reminded each class that if they experience any increase in symptoms either due to pool temperature or the exercises, they need to seek reevaluation.

MARCHING/ALTERNATING KNEE LIFTS

Level 1

- While in chest deep (nipple line) water level, march (alternating knee lifts) traveling forward using arms in opposition of knees
- Knees come up to create an 80–90 degree angle in the hips
- Hands are in a fist, webbed, claw or sliced position
- Foot placement focus is on heels
- Body alignment is in neutral or slightly forward flexed at the hip (maintaining head and shoulders in alignment, no more than 10 degrees forward flexion at the hips and abdominals are contracted to support lower back)

TIP: If an individual needs balance support have him/her march along the pool wall or use a floatation piece of equipment (noodle, comfy log, etc.) in front of his/her body for support. Discourage leaning on equipment or wall—it is only to be used when needed.

Increase or decrease distance and speed according to the individual's goal and ability. Use of pool equipment can also be added to increase intensity. For example a floatation belt can be used to walk suspended and speed can be increased to turn marching into jogging. Equipment usage, direction change and increase in speed can also add variety to this exercise and increase intensity.

Level 2

- Start with feet firmly planted and weight evenly distributed in chest deep (nipple line) water level, use pool wall for support and lift one knee up at a time, returning to starting position and repeating on other side
- Lift knee up to create a 90 degree angle (or less) in the hips
- If unable to lift knee, bend or soften knees one at a time
- Hands are active (holding onto wall) yet relaxed (not overly gripping)
- Body alignment is in neutral
- If individual experiences paralysis in one leg, s/he can actively assist with one hand to lift their knee up

Level 3

- If individual can weight bear and can bend both knees, start by facing wall and bend knees while holding onto wall with both hands as if sitting back into a chair (squats).
- If unable to weight bear, start seated utilizing pool steps or grounded pool equipment, horizontally suspended on a floatation mat or suspended vertically with a floatation belt. Bend or soften knees one at a time, alternating from left to right or vice versa.
- If unable to bend knees voluntarily, try to actively assist legs by placing hands behind thighs to bend and lift knees.
- Pay close attention to ankle mobility and if possible encourage participant to dorsi and plantarflex foot. Dorsiflexion while lifting/bending knee, planter flexion while returning to starting position.

TIP: Variation—use an aqua step. Step over or on and off the step to build balance and strength.

Some individuals will require assistance, due to balance, range of motion and strength limitations. In group settings, it is recommended that individuals with needs bring an assistant to class with them.

SIDE STEPS

Levels 1 and 2

- While in chest deep (nipple line) water level, take a step to the right or left side while keeping legs straight (knees soft). Repeat several times then change directions.
- Arms move like wings (as the leg move out to the side the arms move up toward the surface of water then back to sides of body when legs are together). Hands are in clawed, webbed or slice position.
- Toes face forward (frontal plane).

TIP: To increase intensity, increase range of motion, speed and change direction after a few repetitions. If individual needs balance support have him/her move along pool wall or use a flotation piece of equipment (noodle, comfy log, etc.) to hold in front of body for support. Discourage leaning on equipment or wall—it is be used only as needed.

Level 3

- While in chest deep (nipple line) water level, stand next to wall hold on with one hand, lift leg to the side (abduction in horizontal plane), return to starting position and then repeat on other side. Optional-free arm can follow leg movement according to ability. If more stability/support is needed face wall and hold on with both hands.
- Hand(s) are active (holding onto wall) yet relaxed (not overly gripping).
- Body alignment is in neutral.
- If participant is unable to weight bear but has voluntary movement of lower extremities this movement can be done vertically suspended utilizing a floatation belt or horizontally suspended using a floatation mat. Both legs can be done at the same time or one at a time.
- If participant is unable to voluntarily move lower extremities focus is placed on upper extremities and or focus on trunk mobility and control while seated or suspended.

STATIC HAMSTRING STRETCH

Level 1

- While gently holding onto wall with one hand, reach under knee with the other and gently straighten leg.
- Maintain body alignment in neutral. (Encourage participants to lengthen spine to maintain alignment and to not hold breath.)
- Hold position for 5–30 seconds and then repeat on other side.

Level 2

- While facing wall gently hold onto to it for balance with both hands.
- Standing upright with body in neutral alignment place the heel of one foot in front approximately 10 inches in front of the other foot.
- Gently bend knee of supporting leg as if sitting back into a chair behind you while maintain other leg straight.
- Lift toes up (dorsiflexion).
- Hold for 5–30 seconds and then repeat on other side.

Level 3

- While seated on pool steps or grounded pool equipment lengthen one or both legs in front of body.
- Dorsiflex foot toward body.
- Slowly bend forward from the hips. Do not allow spine to round forward as you reach toward toes.
- Body alignment is slight forward flexed at the hip maintaining neck and shoulders in alignment. No more than 10 degrees flexion at the hips and abdominals are contracted to support lower back.

TIP: If hamstrings are tight, bends knees slightly. If spasticity or tremors occur, stop and rest; resume activity when comfortable to do so.

ACTIVE CHEST STRETCH

Level 1

- While walking reach hands forward then open to sides as if doing the breast stroke.
- As arms move to side squeeze shoulder blades together.
- Lift sternum and maintain spine in neutral alignment and shoulders down.
- Focus is placed on moving shoulder joint through a full range of motion (horizontal abduction).

Levels 2 and 3

- While standing in place or seated reach hands forward then open to sides as if doing the breast stroke.
- As arms move to side squeeze shoulder blades together.
- Lift sternum and maintain spine in neutral alignment and shoulders down.
- Focus is placed on moving shoulder joint through a full range of motion (horizontal abduction).

TIP: If balance problems do not allow participant to maintain an active range of motion, this movement can be done as a static stretch by reaching both hands behind body and holding position. Wall (if standing face away from the wall) or seat can assist in maintaining posture.

TRUNK TWISTS—SPINAL ROTATION

All Levels

- Stand with feet shoulder width apart (seated—Level 3)
- If possible, shoulders are below water surface.
- Hands are extended out to each side at shoulder height.
- Rotate slowly from one side to the other while looking over each shoulder.

- Make sure to twist at the waist and not only at your neck or hips.
- If standing, keep knees soft and shoulders relaxed.

TIP: Variation—Level 1: This can be done while walking (see Walking Twist on page 18.)

LEG/HAMSTRING CURL

Levels 1 and 2

- Bend knee and lift foot behind body toward buttocks.
- Alternating from left to right and vice versa.
- Maintain neutral spinal alignment (do not hyperextend back).

TIP: To increase intensity one can increase speed, add rebound impact option and/or travel. To decrease intensity, stand in place, decrease speed and maintain grounded impact option.

Level 3

- While vertically suspended, bend knee and lift foot behind body toward buttocks.

If participant does not have voluntary movement of lower extremities, strengthen gluteals (buttocks) by contracting, holding contraction and releasing (see gluteal sets in chart below).

TIP: If balance difficulties exist, keep participant near wall with assistant.

WALKING

Levels 1 and 2

- Start with feet firmly grounded, weight evenly distributed and spine in neutral alignment.
- Take a step forward as arms naturally swing in opposition.

- Focus on heel-toe-heel placement of foot
- Exaggerate push off and knee flexion stage/ motion of walking.

TIP: Use buoyancy (flotation) and drag equipment to increase and decrease resistance and balance demands. Individuals with balance problems may need to first practice near a wall and/or march in place.

Level 3

- If weight bearing is possible, start by standing facing wall.
- Place feet slightly forward.
- While gently holding onto wall, bend knees and sit back as if sitting back into an imaginary chair.
- Return to starting position and repeat.

If individual cannot weight bear, start by working on weight shifting/transfer skills and ankle dorsiflexion and plantarflexion.

PELVIC TILTS

All Levels

- Place back against wall and press small (lumbar spine) area of back against wall. Make sure you are low enough in the water that shoulders are below water.
- Keep head and shoulders in alignment.
- Hold pelvic tilt (posterior tilt) for a few seconds, release and repeat.
- Then press tail bone back against wall as the top of your hipbone tilts forward creating a slight anterior tilt and the small of the back comes away from wall. Do not over extend back into position that causes pain.

CROSS COUNTRY SKI

Levels 1 and 2

- Stand with one leg forward, the other leg behind (approximately 2–3 feet apart).

- Place arms opposite of legs one in front of the body the other in back of body (left arm forward, right leg back and vice versa).
- Quickly switch leg and arm positions and repeat.
- Maintain spine in neutral alignment.

TIP: Use hand variation and flotation equipment to modify intensity. To increase intensity bend and extend knees (combination flexion and extension of knees) - this can be done in rebound or suspended (with flotation equipment). Another variation involves keeping legs extended and use of a pendulum motion while suspended.

Level 3

- While seated move arm and leg (knee flexion and extension) in opposition (right leg forward, left hand forward and vice versa).
- If individual does not have voluntary control of lower extremities, focus on upper extremities. If one side of body (arm and leg) is paralyzed, then focus on side that has voluntary movement control (arm forward as leg goes back).

ROCKING HORSE

Level 1

- Rock/shift body weight forward onto the right leg while lifting the left heel up behind the body.
- Rock/shift body weight backward onto the left leg while lifting the right knee up in front of the body.
- Maintain spine in neutral alignment throughout entire movement, never arch/hyperextend the lower back.
- Counter balance weight of body by moving the arms back (scoop/push water back) as you shift weight forward and vice versa.
- Repeat with left leg forward.

Level 2

- While standing next to wall place one hand on wall gently for balance.
- Shift body weight forward onto right leg (standing leg) as left leg curls behind body.
- Use left arm in opposition, swing/reach arm forward as body weight shifts forward.
- Maintain spine in neutral alignment throughout entire movement, never arch/hyperextend the lower back.
- Shift body weight back as left leg lifts forward (knee lift on left leg).
- Left arm swings/reaches back as body weight shifts back.
- Repeat sequence several times.
- Change sides and repeat this movement using right arm and leg, using left leg as standing leg.

Level 3

- While seated or vertically suspended, rock upper body weight forward and back.
- Swing/reach arms in opposition (one forward the other back).
- Maintain spine in neutral alignment throughout entire movement.
- Use wall or partner for support.

TIP: A good way to introduce this movement is to teach upper body movement, lower body movement and weight shift separately. Participants find success in fine tuning and perfecting each component of this movement before combining. Also in breaking down this movement all levels are able to learn weight shift and arm movements together. Leg movements can then be given as level 1 and 2 options.

STRAIGHT LEG WALK

Level 1

- Walk forward or backward with straight legs.
- Use extended arms in opposition.
- Pause in mid motion and hold leg and arms in opposition for 2–3 seconds before taking another step.
- Lengthen spine while maintaining it in neutral alignment.
- Resume movement and repeat, remembering to hold each time in mid motion.
- Cue “toes up and heels down.”

Level 2

- Start with feet together and firmly planted, while standing next to wall or holding a supportive flotation piece of equipment.
- Lift one leg straight in front of body.
- Pause and hold leg in mid motion for 2–3 seconds before returning to starting position.
- Lengthen spine while maintaining it in neutral alignment.
- Repeat, using other leg.

Level 3

- Start seated with knees and hips at a 90 degree angle.
- Place arms at surface of water and allow them to gently float.
- Close eyes and try to maintain upright position.
- Lengthen spine while maintaining it in neutral alignment.

TIP: To increase challenge of this movement, ask participant to lift knee, pause and hold for 2–3 seconds.

SIDE TILT/LATERAL WEIGHT SHIFT

Level 1

- Start in a suspended vertical position (use flotation belt).
- Lean toward the right and reach with right hand (just a few inches) toward pool bottom while leg sway slightly toward the left.
- Do not bend at the waist, maintain spine in alignment (Envision a line connecting the head, shoulders, hips, knees and feet).
- Return to upright vertical position.
- Repeat on left side.

TIP: This activity can be modified by keeping participant near wall or using an additional flotation device (example: a noodle or water log) for added support.

Level 2

- Start in a grounded vertical position standing next to wall, place leg closest to wall 2–3 feet away from wall.
- Reach hand closest to wall gently toward wall as you lean toward wall.
- Allow leg farthest from wall to slightly float apart from other leg (no more than 2 feet apart).
- Do not bend at the waist, maintain spine in alignment (Envision a line connecting the head, shoulders, hips, knees and feet).
- Try to maintain control of movement by utilizing core stabilizers, rather depending on leaning on or holding onto wall.
- Return to upright vertical position.
- Repeat on left side.

Level 3

- While seated on pool steps or grounded pool equipment, shift body weight to right side of body. If possible, allow left buttock to lift off of seat.
- Reach with right arm away from body as you lean toward right.
- Try to maintain control of movement by utilizing core stabilizers, rather depending on seat.
- Return to upright vertical position.
- Repeat on left side.
- Try to maintain control of movement by utilizing core stabilizers, rather depending on seat.
- Return to upright vertical position.
- Repeat on left side.

TIP: This activity can be modified by keeping participant near wall or by holding onto flotation device (example: a noodle or water log) for added support. Noodle can also be wrapped around back of participant for balance. Encourage participant not to depend on assistive equipment.

ADDITIONAL EXERCISE OPTIONS

EXERCISE BENEFIT	ACTION	CUEING/TIPS
UPPER BODY		
Elbow bend Elbow flexion/extension Strengthens arm and improves flexibility in elbow joint	Starting with arms at sides of body, bend elbow joint, return	Aim palm or thumb to shoulder on the way up and palm or index finger down on return
Side arm raises Shoulder adduction and abduction Strengthens shoulders	Starting with arms at sides of body, raise arms to shoulder height or lower, return	Keep thumbs forward. When raising arms overhead, turn palms toward sky at midway point—then reverse on return.
Forward arm raises Shoulder elevation Shoulder strength and flexibility	Starting with arms at sides of body, raise arms forward, return	Keep arms in water. When moving arms overhead use caution breaking water surface and remember to keep palms facing each other.
Arms swings Shoulder strength and flexibility	Swing arms forward and backwards by sides of body	Keep palms facing body and thumbs up
Arm circles Shoulder strength and flexibility	With hands on shoulders, down by sides or out to shoulder level, slowly circle the arms from the shoulders	Circle forward, then backwards. Start with small circles then enlarge.
Overhead reach Shoulder strength and flexibility, trunk	Start with hands on shoulder, slowly reach overhead	Never raise arm to a point of discomfort
Butterflies Horizontal shoulder adduction/abduction Improves strength and flexibility in chest, back and shoulders	Starting with arms by sides at shoulder height, bring hands together in front of body, return	For variation, turn into a swimming motion and play with hand positioning
Shoulder rotation Shoulder strength and flexibility	Holding arms at side with elbow bent to 90 degrees, move hand toward belly and then to the starting position	Use hand variation to change resistance—cup hands, make a fist or spread fingers
Punching Strength, endurance, hand and wrist flexibility	Hands in a fist, alternate arms punching. Push arms to full extension—apply hand variations.	Keep elbows soft

EXERCISE BENEFIT	ACTION	CUEING/TIPS
Forearm rotations Forearm strength and flexibility	With elbows bent, face palm of hands down then up	Keep hands and fingers relaxed
Wrist circles Wrist strength and flexibility	Rotate hands clockwise/counter clockwise	Keep hands and fingers relaxed
Wrist flexion/extension Wrist strength and flexibility	Start with hands flat and parallel to the surface of the water, move hand and fingers up toward sky, then down toward feet	Relax fingers and isolate movement at the wrist
Chin tucks Reduces neck fatigue Improves posture/appearance	Pull you chin back as if to make a double chin, then raise your neck straight up as if someone was pulling up on your hair. Release and repeat.	Keep head straight—don't look down
Head turns Improves cervical/neck flexibility	Start with a chin tuck then turn your head to look over your shoulder. Return to the center and repeat over other shoulder	Avoid lifting shoulders to meet chin. Relax shoulders.
Head tilts Lateral flexion Improves cervical/neck flexibility	Start with a chin tuck then slowly lower head toward right shoulder as if to touch ear lobe to shoulder. Repeat on other side.	Never roll head backwards. Maintain good alignment with head over shoulders and chin tucked.
Shoulder rolls Retraction/protraction of scapula Improves posture	Roll shoulders backwards slowly through full range of motion	Keep shoulders at chin level. Do not drop head.
Shoulder shrugs Elevation/depression of scapula Improves posture	Lift shoulder toward back of head, then relax Variation: lift and depress one shoulder at a time	Breathe normally and do not tilt head from side to side when doing one shoulder at a time
Upper back stretch Flexibility	Rap arms around upper body and give yourself a hug	Breathe normally while rounding shoulders.
LOWER BODY		
Gluteal sets Strengthens buttocks and lower back	Squeeze the buttocks tightly together. Hold, release and repeat.	Maintain soft knees.
Front leg lifts Hip flexion Improves balance, coordination, and flexibility	Lift extended straight leg up forward, alternating or one at a time	Maintain soft knees, spinal alignment and flexed foot. Avoid hyperextension and spasticity.

EXERCISE BENEFIT	ACTION	CUEING/TIPS
Leg curls Knee flexion and extension Improves strength and flexibility of legs and lower back	Lift foot towards buttocks. Alternating or one at a time. Variation: Lift right heel to left buttocks and left heel to right buttocks	Maintain spinal alignment straight back. Contract abdominals by moving front hip bones upward toward rib cage (keep chest lifted).
Side leg lifts and cross-overs Hip abduction and adduction Improves balance, coordination, flexibility and leg strength	Lift extended leg out to side Variation: Cross leg in front then in back of the other	Maintain soft knees, spinal alignment and flexed foot to avoid hyperextension and spasticity
Karate kicks Improves coordination, flexibility and strength	Lift leg with a bent knee and extend with power. Variation: out to side or rear	Always maintain soft knees and spinal alignment
Calf stretch Flexibility	Stand facing wall with one leg in front of the other. Press heel down on back leg.	Avoid hyper-extending the knee
Rear leg lifts Hip extension Improves lower body flexibility and strength	Slightly lift extended leg behind you. Alternating or one at a time.	Maintain spinal alignment. Contract abdominals by moving front hipbones upward toward rib cage (keep chest lifted).
Ankle circles Ankle strength and flexibility	Make circle with foot. Repeat in opposite direction and on opposite side.	Relax toes
Ankle dorsiflexion/plantarflexion Ankle strength and flexibility	In seated position, point toes up and then down while keeping bent knee	Move foot directly up and down and not in and out (avoid inversion and eversion)
Front thigh/quad stretch Flexibility	While standing near wall, bend knee and hold ankle with hand. Extend thigh back and press front hip bone forward.	Maintain spinal alignment. Thigh should stay in alignment, perpendicular to the pool bottom.
Jacks Double leg abduction/adduction Improves coordination, flexibility and strength	Starting position: Standing with legs together. End position: Legs apart Variation: Can be done with or without side arm raises, and as double cross-overs.	Use hand variations for intensity modifications. *Using flotation/buoyancy equipment is recommended to reduce the effects of gravity on the skeletal system.

EXERCISE BENEFIT	ACTION	CUEING/TIPS
TRAVELING MOVEMENTS/WATER WALKING		
Step over walk Balance, mobility, flexibility, arm and leg coordination; endurance	Walk forward as if stepping over an object. Use swimming arms.	Maintain spinal alignment and keep focus of eyes ahead instead of toward floor.
Cross-over steps Balance, mobility, flexibility, arm and leg coordination; endurance	With or without arms, cross leg over the other when taking a step	Use hand variations for intensity modification and variety
Jogging Improves stamina, coordination and strength	Same as alternating knee lift done as a rebound move. (See page 5 for rebound definition)	Remain in upright position, maintaining spinal alignment
Walking twist Coordination, flexibility of trunk	With elbows bent in front, lift knees high so that right elbow meets left knee, then left elbow meets right knee	Remain in upright position, maintaining spinal alignment
JUMPS		
Frog Strength, balance and endurance	Jump with knees bent and out to sides	Remain in upright position, maintaining spinal alignment. Avoid leaning forward. *Using flotation/buoyancy equipment is recommended to reduce the effects of gravity on the skeletal system.
Curl tuck Strength, balance and endurance	Jump with knees bent and heels toward buttocks	Remain in upright position, maintaining spinal alignment. Avoid leaning forward. *Using flotation/buoyancy equipment is recommended to reduce the effects of gravity on the skeletal system.
Knee tuck Strength, balance and endurance	Jump with both knees together and in front of body	Remain in upright position, maintaining spinal alignment. Avoid leaning forward. *Using flotation/buoyancy equipment is recommended to reduce the effects of gravity on the skeletal system.

EXERCISE BENEFIT	ACTION	CUEING/TIPS
TRUNK		
Knee hugs Balance and flexibility	Standing near a wall reach under knee and gently bring knee up toward chest. Use right hand for right leg. Variations: Use right hand for left leg. Stand upright or release upright position and round upper body toward knee.	Breathe normally. Relax shoulders and feet.
Twists-spinal rotation Coordination, flexibility and strength	Feet shoulder width apart, shoulders in water, twist slowly from side to side.	Knees soft, move body as a unit. Avoid twisting spine (especially with hop).
Wall press/modified push up Strengthen lower back and pelvic floor, improves posture	Facing wall, lean forward, and hold for 5 seconds. Return and repeat.	Focus on maintaining spinal alignment by using the muscles that support the spine (abdominals, erector spinae and lower back)
Suspended double side leg extensions Stabilization, strength and flexibility	While using floatation equipment, to support body without restricting movement around trunk, extend both legs to one side while slightly leaning toward the other side. Alternate from left to right.	Relax shoulders

Class Structure and Cueing

STRUCTURING AN AQUATIC CLASS FOR PEOPLE WITH MS

A successful aquatic class for people with MS is founded on principles similar to those used to teach a general aquatic class. Basics include personally greeting each student, asking about relevant physical conditions, modifying movement and using equipment for various abilities and incorporating new students into an established class. An emphasis should be placed on greeting and understanding the students' physical conditions and goals, and structuring class appropriately, making modifications as necessary—make sure that each participant is involved. **Do not leave anybody out!**

Use a **DIRECT** approach during class and for lesson planning.

- Define levels of ability (assessment)
- Increase intensity and duration gradually
- Repeat cues and directions
- Encourage efficient movement patterns
- Control (speed, range of motion, surface area, direction, turbulence)
- Temperature of the water

BEFORE YOU START

- If possible talk with all students privately before the first class to discuss goals, an overview of the program, class structure and format. Be clear that the class is not physical therapy, swimming lessons, or water aerobics. (For students with fatigue, offer suggestions to conserve energy such as wearing a bathing suit under warm-up suit to class so only one change is required at the pool. Another tip is use of a backpack rather than the standard beach or gym bag.

- New students may want the option of observing a class from the deck the first day. They can decide if they will be comfortable with the class, determine if they will be able to get in and out of the pool, and enter the building from the parking lot without undue fatigue.
- Monitor new students until there is a general comfort level reached.
- Create the proper atmosphere (comfortable, friendly, noncompetitive and safe.) Recommended water temperature is 80–84 degrees; however, some individuals work well in higher water temperatures. While each individual is unique, extremes in temperature in either direction seem to adversely affect most individuals with MS. Talk to participants about temperature regulation (hydration, “chill vests”, undershirts, etc.) so that they are comfortable (not too warm or too cool) while in the water and after getting out of the water. In addition, don't forget humidity, direct sunlight, and other environmental factors that can affect a person's ability to maintain appropriate core body temperature.

GREETING

- A positive attitude is important when leading a class, it sets the tone for all interactions.
- Be aware of any physical changes in participants either during a class or since the last class.
- Familiarize students with the facility and class format.

SAMPLE CLASS STRUCTURE

An aquatic session often consists of a warm-up, stretching/range of motion exercises for flexibility, upper and lower body strengthening, endurance activities (if tolerated), cool down, and (optional) games.

This program emphasizes the whole person. The lesson plan should reflect the emphasis on wellness, by including information on overall health. A group session usually lasts 30–45 minutes.

Remember: The essentials of instruction are **content** and **presentation**. Content includes concepts, skills, and knowledge to select exercises and plan the exercise session. Presentation is the delivery and interaction with participants.

TIPS:

1. Inquire about symptoms experienced since last class.
2. Consider adding a “mini lecture” 2–3 minutes about health, wellness, energy conservation tips, etc. to maintain the interest of participants. An invited guest is an option, as well.

WARM-UP

This can consist of gentle, rhythmical movements to acclimate to the temperature of the water and the effects of buoyancy/reduced gravity. These can include walking, marching in place, and or continual upper/lower body movements.

FLEXIBILITY/RANGE OF MOTION

Flexibility exercises involve two components—joint range of motion, moving each joint through its full range of motion, and muscle flexibility, or stretching the muscle.

Range of motion: Range of motion (ROM) is defined as the movement at a particular joint. The length of soft tissue structures, such as muscle and ligaments, which surround the joint can affect movement as well as pain and joint flexibility.

ROM exercises are designed to maintain and/or achieve maximal joint movement. These exercises can be used to improve flexibility of a specific joint and/or increase muscle strength. It is important to move the joint through its full range of motion. Muscles of the lower leg, posterior thigh (i.e., hamstrings), buttocks, and lower back are often weak and may make walking more difficult. Select exercises to strengthen these muscles: hip flexors, hip extensors, ankle dorsiflexors, hip abductors, trunk for flexion and extension. It is important that a rehabilitation therapist evaluates a range of motion impairment to ensure that the proper stretching techniques are utilized.

Stretching: Gentle, slow stretching may help reduce the effects of spasticity. Stretching the following muscles—quadriceps, calves, gluteals, lower back, shoulders, neck, hip adductors, rotators of the hips, spinal extensors, and pectoral or chest muscles—will provide a comprehensive flexibility program for most people. Some people may require specific stretching exercises to address range of motion impairments.

REPETITION

Repetitive exercises help improve endurance and may improve problems with coordination and performance of activities of daily living. Use low weights, high repetition, if weights are used. However, weights are not necessary and may tire out the muscle rather than strengthen it. The resistance of the water with changes in speed, force, hand or leg position, and depth of the water will suffice to strengthen the muscles of most participants.

COOL DOWN

The cool down involves slower activities, patterns of walking, relaxation, and a return to the effects of gravity.

POINTERS

- Think overall wellness, not just strength or cardiovascular fitness.
- Use an exercise-rest-exercise-rest or high intensity-low-intensity format (H-L-H-L) to prevent fatigue and overheating. (Rest may be an active rest and recovery, or a relaxation). Encourage breaks as needed. Encourage participants to find their own comfortable intensity levels. Encourage use of a rate of perceived exercise (RPE) scale to monitor intensity during exercise.
- Use body awareness techniques to increase relaxation and postural awareness. One session could be used solely for relaxation ("feel the water support you", "listen to the ripples").
- Explain the rationale for choosing the exercises (e.g.; to work towards a better gait pattern and improve balance and coordination). This assists participants to set realistic and functional goals.
- Vary order of activities from class to class. Classes should be goal oriented not "routine"—and always enjoyable.
- Emphasize the use of a flat foot when leading exercises for gait training (as in warm up exercises) as walking on the toes may induce extensor spasticity in the legs. For these exercises, use cues, "heels to the bottom or strike with heel." However, it is not essential to emphasize use of a flat foot for exercises to improve strength or balance.
- Eliminate actions that involve the participants "hanging" on the pool wall. A noodle is preferred to wall-handing exercises.
- Encourage participants to exercise at their own pace, listen to body signals, and to make modifications as needed.
- Provide opportunity for socialization to help create support and encouragement among participants.
- Encourage participation by all. Modify movements or activities as needed. No one should be made to feel discouraged or left out.
- Explain exercises clearly and repeat the movement during the execution to assist participants experiencing short-term memory loss or coordination issues.
- Encourage the use of senses to enhance learning. Use images to accompany new sensations. Ask students to articulate what they experience to encourage a sense of discovery, curiosity and observation.
- Recognize each individual as an adult learner, with specific abilities and restrictions. Do not impose your expectations or level of ability.
- Make it fun!

CLOSING AND AFTER CLASS

- Make yourself available to students for their questions.
- Avoid making any promises regarding results.

Lesson Planning

LESSON PLANNING: HOW THE BODY WORKS

Evaluate the exercises you select for your class for functional activities and wellness. Use normal movement patterns and a range of motion that will not create injury, pain, or undue fatigue. Next, evaluate whether or not the movement can be performed at an intensity and position to permit proper body alignment. The intensity and design of the movement should produce a controlled, smooth movement without momentum as the primary moving force.

This work sheet may be useful to you in designing a lesson plan. Think about posture, range of motion, safety, the impact on functional activities, and the ability of your participants.

Head _____

Shoulders _____

Arms _____

Elbows _____

Hands and wrists _____

Spine _____

Pelvis _____

Legs _____

Foot and ankle _____

SAMPLE LESSON PLAN FOR CIRCUIT

Circuit training adds interest to the class and accommodates various ability levels at one time. The participant selects stations within his/her ability or moves on if a station is too difficult or tiring.

Circuit training utilizes the equipment on hand, and does not require a large purchase of equipment for each person at the same time. Kick boards, pull buoys, bar bells, balls, gloves, and noodles offer a myriad of possibilities for a circuit. It is possible to have a circuit without equipment. Plan stations of rocking horse, scissors, figure 8s, biceps curls, and other exercises from your routine.

The stations and number of stations you select depends upon the ability of your class. Use laminated cards or waterproof paper with large print to describe each station.

WARM-UP: 5 MINUTES

- Walk forward, arms push water away
- Walk backward, arms pull water toward body
- Straight leg walk, arms front to back
- Side step, arms scissor

CIRCUIT: 10–20 MINUTES

- Bar bells—shoulder elevation
- Bar bells—shoulder rolls
- Leg/hamstrings curls
- Front leg lifts—hip flexion
- Gluteal sets or rear leg lifts—hip extension
- Bar bells—elbow flexion
- Bar bells—elbow extension
- Pull buoy, place heel on top of strap and side leg lift
- Noodle, straddle and bicycle for count of 25
- Bar bells, arm crossover under water
- Punching
- Rocking horse
- Marching/alternative leg lifts

STRETCH/FLEXIBILITY: 5–10 MINUTES

- Major muscle groups
- Range of motion exercises

COOL DOWN: 5–10 MINUTES

- Walk patterns similar to warm-up in slower, smaller ranges of motion

Cueing

There are three categories of cueing, **Correctional**, **Motivational** and **Transitional**. Cueing provides a signal to class participants:

- **Correctional or “form” cue:** to take note of body alignment and technique. Always use positive cues, such as “knees soft”, rather than “don’t lock your knees”.
- **Motivational cue:** for encouragement and reinforcement
- **Transitional cue:** to make a change in tempo/rhythm, activity or direction, such as:
 - » Directional “forward, back etc.”
 - » Numerical “1, 2, 3, 4, etc.” or “4, 3, 2, 1, etc.”
 - » Footwork “right, left, right, etc.”
 - » Step “rock, kick, swing, etc.”
 - » Rhythm “half time”, “double time”

Cues can be vocal, visual, or a combination of both. Variety in cueing is important because participants are different in their learning capabilities.

TIP: Remember many people with MS experience cognitive impairment that could affect concentration and/or memory.

Music

Music can be a great tool for motivation, relaxation, maintaining cadence, or achieving the desired intensity if used appropriately. However, whatever your reason for using music in a group setting it should always complement your class and never distract or take away from the purpose or goals of the class. If music is not adding benefit, and/or is making it hard to understand cues, it is best not to use music at all.

Pool Safety and the Environment

SAFETY AROUND THE POOL WATER SAFETY

Water adds an element of danger that is not present during land activities such as falls on slippery decks or drowning. Keep the following in mind:

- If a person cannot participate in the aquatic class without assistance, s/he need to have an aid in attendance at each class.
- Have class participants use the buddy system when in the pool even if the lifeguard is on duty. Do not overestimate the ability of participants or leave them in water alone.
- Keep the deck clean and free of equipment to reduce incidence of injury. Store or stack equipment after each class.
- Assist participants when entering or exiting the pool. Use volunteers if needed (not other participants). Be aware of individuals who may be fatigued and need extra assistance after the class.
- Do not allow participants to eat or chew gum during class. Do not allow glass bottles on pool deck.
- Do not leave objects floating in the pool.

- Do not allow horseplay in the pool area or running on the deck.
- Orient all participants and volunteers to emergency protocol. Practice a safety drill with the class at least once a month.
- Check water temperature before each class. Optimum water temperature is 80–84 degrees. Higher temperatures may cause fatigue in many people with MS.
- Examine the building and parking lot for possible hazards or handicaps.
- There should always be a lifeguard on duty during a class.

PARTICIPANT SAFETY

Precautions to remind participants of at the beginning of each class:

- Rubber tips on canes and walkers lose their grip on wet surfaces and can become a risk. Remind participants to be aware of this around the pool deck.
- Stress the importance of each participant knowing his/her own limitations and to exercise at his/her own pace. The class must not be competitive in nature. It is OK for people to take short breaks during the class if needed.
- Remind participants of the difference in significant feeling between buoyancy and gravity. They will feel lighter in the pool and once they begin walking out of the pool they will need to use extra strength to walk back to the changing rooms. Participants may want to sit wrapped in a towel for a few minutes and have a cool glass of water, giving the body a chance to acclimate.
- If at any time, a person begins having trouble in the water or symptoms increase, suggest contacting the physician. Do not make a judgment or give medical advice.

- Shoes may increase stability on the pool deck and offer protection if participant has a shuffling gait, ataxia (uncoordinated movements), or decreased ankle dorsiflexion during gait.
- Encourage participants to exercise at their own pace and listen to their body for signs of heat, weakness, or fatigue.

Be aware of the following symptoms that may occur during or immediately following class:

- General weakness
- Fatigue
- Blurred vision
- Tremor
- Tingling
- Slurred speech
- Spasticity
- Pain
- Stress or anxiety
- Nausea
- Rapid eye movement
- Coordination or balance disturbance

MORE ON SAFETY

- Most exercises are performed in the shallow end of the pool for safety and to decrease the effects of buoyancy. This depth, at approximately the navel (or somewhere between the navel and nipple), affords ease of movement, some weight bearing input to the brain, a cooling effect on the body, and protection from falls.
- Some participants do not have the strength to swim or have never learned to swim. Identify those who can swim and those who cannot. If there is a doubt, request a performance swim. This is necessary if you plan a deep water relaxation session. Floatation devices are not life saving devices, therefore, do not take a person who is afraid of the water or cannot swim to deep water.

A National Multiple Sclerosis Society Aquatic Program

OBJECTIVES

1. Improve socialization, decrease isolation
2. Promote well being and improve self-esteem
3. Provide an atmosphere to exercise that minimizes or prevents a rise in core body temperature
4. Prevent symptoms secondary to MS (i.e.: muscle atrophy, joint contractures pressure sores)
5. Maintain or improve range of motion and flexibility of joints
6. Maintain or increase endurance potential
7. Maximize muscle strength

Speak to our chapter staff about potential opportunities.

Call 1-800-344-4867 to contact the chapter in your area or visit nationalMSSociety.org.

The National Multiple Sclerosis Society (“Society”) is proud to be a source of information on multiple sclerosis related topics. The information provided is based on professional advice, published experience, and expert opinion, but does not constitute medical or legal advice. For specific medical advice, consult a qualified physician. For specific legal advice, consult a qualified attorney.

The Society does not endorse products, services or manufacturers. Such names appear here solely because they are considered helpful information. The Society assumes no liability for the recipient’s use of any product or service mentioned. The Society does not independently verify whether the information provided by each service provider is accurate. The Society undertakes no responsibility to verify whether the service provider is appropriately licensed and certified and has applicable insurance coverage.

Early and ongoing treatment with an FDA-approved therapy can make a difference for people with multiple sclerosis. Learn about your options by talking to your healthcare professional and contacting the National MS Society at nationalMSSociety.org or 1-800-344-4867.

The Society publishes many other resources about various aspects of MS. Call 1-800-344-4867 or visit nationalMSSociety.org/brochures.

The National MS Society mobilizes people and resources so that everyone affected by MS can live their best lives as we stop MS in its tracks, restore what has been lost and end MS forever. To fulfill this mission, the Society funds cutting-edge research, drives change through advocacy, facilitates professional education, collaborates with MS organizations around the world, and provides programs and services designed to help people with MS and their families move their lives forward.



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